


June 2016

Agricultural Research Partnerships (ARP) Network NOTES

Welcome to ARP Network Quarterly Notes! Our goal is to keep you informed about ARP Network and Agricultural Research Service's current information. We hope that the notes build networking opportunities for businesses to connect with ARP Network Members.

Please help us spread the word by sharing ARP Network Notes statewide with your company contacts, colleagues, other organizations, etc. Thank you!

ARS

The Agricultural Research Service (ARS) is USDA's primary internal research agency. ARS conducts research to develop and transfer solutions to major agricultural problems that are both national and international in scope. ARS has nearly 2,000 scientists nationwide and a few in overseas locations. ARS scientists carry out 750 research projects on a variety of subjects. ARS has a Congressional mandate to disseminate the research findings of these projects to the American public and other interested parties. Learn more by visiting: http://www.ars.usda.gov.

ARP Network

The ARP Network enlists the help of partners to spark economic development, entrepreneurship and community development. USDA ARS founded the ARP Network in an effort to expand the impact of ARS research and provide resources to help companies grow. By combining ARS research expertise with complementary capabilities and talents of partnering organizations, the ARP Network helps stimulate economic growth through technological advancements. The ARP Network matches business needs with ARS innovations and research capabilities and provides business assistant services to help companies and startups solve agricultural problems, develop products and create new jobs. Learn more by visiting: https://www.ars.usda.gov/business/Docs.htm?docid=24715.

ARS News

In Case You Missed Our Webinars

Partnership Pays: Building a Relationship with ARS to Enhance Your USDA SBIR Proposal

ARS recently co-presented a webinar with USDA-SBIR titled, *Partnership Pays: Building a Relationship with ARS to Enhance Your USDA SBIR Proposal*. This was a collaborative effort with University of Arkansas at Little Rock Small Business and Technology Development Center, the Small Business Administration, USDA, NIFA-SBIR and ARS.

The webinar provided information on the USDA SBIR program, how small companies can collaborate with ARS scientist and labs to develop a Cooperative Research and Development Agreement (CRADA) and how to license an ARS developed technology. One of the main focuses was to highlight the process of developing a CRADA with ARS in preparation for a SBIR proposal submission and the timelines required to successfully submit the CRADA with an SBIR application.

For those of you who could not attend (or for attendees who would like to view it again or share it with someone who could benefit from the information discussed), you may find the link here.

How to Partner with ARS to Move Technologies Out of the Lab and into the Marketplace

ARS hosted a webinar titled, *How to Partner with ARS to Move Technologies Out of the Lab and into the Marketplace,* to highlighted ARS's utilization centers in addition to the Beltsville Human Nutrition Center. The purpose was to complement the 75th anniversary celebration of these centers and to invite members of academic institutions as well as companies to collaborate with ARS scientists and take advantage of our pilot plants.

For those of you who could not attend (or for attendees who would like to view it again or share it with someone who could benefit from the information discussed), you may find the link here.

Are You Planning a Round-Table, Webinar or Other Event in your State?

If you are planning an event in your area, please keep ARS in mind. ARS covers many agricultural topics and may be able to provide event speakers or participates to engage in discussions. ARS is organized into four main program areas: Nutrition, Food Safety, and Quality; Natural Resources and Sustainable Agricultural Systems; Crop Production and Protection; and Animal Production and Protection. Please contact Cathy Cohn: cathleen.cohn@ars.usda.gov

ARP Network Member News

AgLaunch Accelerator to Invest in New Agricultural Innovation Startups

AgLaunch, the Memphis, Tenn. agritech-focused business accelerator program is accepting applications for the fall 2016 cohort. A group of six agriculture and food innovation startups will be selected from across the United States to participate in the AgLaunch Accelerator, which will start in August 2016. Applications will be accepted through June 17, 2016. The six teams that are selected will receive pre-seed investment of up to $50,000, a strong support program, and access to farmers, investors and strategic partners. The 15-week accelerator will begin Aug. 15, 2016 and will culminate with a Demo Day on Nov. 17. For more information on the AgLaunch accelerator application process, or to apply, visit: memphisbioworks.org/aglaunch

ARS Partnership and/or Licensing Opportunities

High Oleic Acid Soybean Seeds

A soybean plant has been developed that contains chemically-induced mutations which cause the plant to produce more oleic acid in its seeds than that produced in a wild-type soybean plant. The mutations occur

in the genes for delta-twelve fatty acid desaturase 2-1B enzyme (FAD2-1B) and delta-twelve fatty acid desaturase 2-1A enzyme (FAD2-1A). The alleles could potentially be used in combination with other alleles to generate new non-transgenic germplasm with high levels of oleic acid for the edible oil market. High oleic soybeans offer higher-functioning soybean oil that meets the needs of a growing number of food and industrial customers. ARS dockets 31.15. Please contact Renee Wagner: renee.wagner@ars.usda.gov

Method for Preparing Phenolic Branched Chain Alkyl Fatty Acids or Esters to Kill Microorganisms

Methods for preparing plant-derived phenolic branched chain fatty acids and methods for using them to kill microorganisms have been developed. The technology could potentially be used as an alternative to bleach as a sanitizer. Phenolic and fatty acids are natural, sustainable compounds and value-added products of agricultural processing. ARS docket no. 47.15. Please contact Jim Poulos: jim.poulos@ars.usda.gov

Novel Methods and Compositions to Evaluate and Determine Inactivation of Hazardous Biological Material after Thermal Food Processing

A time and temperature integrator assay has been invented to evaluate the inactivation processes of hazardous biological material in a sample by quantifying the degradation of DNA using qPCR. Food contains abundant copies of conserved mitochondrial DNA that degrades gradually during microwave or thermal treatment. The amount of intact mitochondrial DNA after processing is correlated with the viability of bacterial pathogens in the processed foods. The assay is quantitative and sensitive, and results can be obtained in 3-6 hours instead of days or weeks. The technology could potentially be used as a test for bacterial contamination after thermal food processing by pasteurization, conventional heating, retorting, industrial microwaving, and roasting for human consumption and/or animal feed. The sample can be a food product (e.g., fruits, vegetables, meat from animals, or eggs) while the item can be any object (e.g., medical equipment, especially reusable medical equipment). ARS Docket no. 42.13. PCT Application No. PCT/US14/54749. Please contact Tommy Valco: thomas.valco@ars.usda.gov

Bioactive Peptides Having Insecticide Activity

Novel bioactive peptides for controlling fire ants (a *Solenopsis spp*.) are described. The peptides act as antagonists to a fire ant receptor for a pheromone biosynthesis-activating neuropeptide/pyrokinin (PBAN/pyrokinin) gene derived neuropeptide ligand. The peptides could potentially be used to develop environmentally friendly pesticides for targeted control of insects. ARS Docket 244.12. Please contact Joe Lipovsky: joe.lipovsky@ars.usda.gov

***In Vitro* Parasite Feeding System**

A parasite feeding system has been invented that could potentially be used as a full tick life cycle system for production of live pathogen stage specific vaccines or testing of anti-tick compounds. The system includes a feeding vessel having an inlet, an outlet, and a membrane positioned across an opening in the vessel. Parasites (preferably ticks) are allowed to attach themselves to the membrane so that as a feeding fluid (preferably blood) is circulated through the vessel, the parasites feed on the feeding fluid through the membrane. The system is a simple, flexible, and economical tick feeding system that closely simulate a tick's preferred host throughout the entire tick life cycle. ARS docket nos. 116.15. Please contact David Nicholson: david.nicholson@ars.usda.gov

Compositions and Methods for Repelling Blood-Sucking and Biting Insects, Ticks and Mites
Structures, activities and synthetic methods of chromenes and their analogs as repellents are described. The compounds can be used as personal protection against blood sucking and biting insects and arthropods such as mosquitoes, ticks, and fleas. The technology could potentially be used as a plant derived, biodegradable Insect repellent for skin, hair and clothing. It could potentially be applied as a spray, cream, ointment, paste or powder with a suitable medium or carrier. ARS Docket 47.09 + 73.16. Please contact David Nicholson: david.nicholson@ars.usda.gov

Compositions and Methods for Control of Hemipteran Insect Stylet Sheath Structure Formation
Many hemipteran insects form a stylet sheath each time they pierce and penetrate plant tissue on which they feed. Compounds that inhibit stylet sheath formation or degraded/destabilize stylet sheaths are described, as well as methods of using those compounds. These methods and compounds deter or block hemipteran insects from feeding on plants, especially agriculturally important plants and thus can prevent or reduce transmission of micro-organisms that use the insects as a carrier-host. The technology could potentially be used to prevent and/or reduce the transmission of vascular associated diseases (caused by hemipteran vector-borne pathogens). The compounds could potentially be applied onto plants by spraying, dripping and/or applied to the soil for uptake by the roots. Many of the compounds are recognized as generally regarded as safe (GRAS). ARS Docket no. 282.12. PCT Application No. PCT/US16/27824. Please contact: joe.lipovsky@ars.usda.gov

Methods and Yeast Strains for Conversion of Lignocellulosic Biomass to Lipids and Carotenoids
The use of oleaginous yeast strains for producing lipids from pretreated lignocellulosic biomass is described. The lipids have fatty acid profiles similar to those of vegetable oils making them attractive for production of biodiesels and jet fuels. Additionally, some yeast simultaneously produces carotenoids, a value added co-product. ARS docket no. 166.13. Please contact Renee Wagner: renee.wagner@ars.usda.gov

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ARS Partnership Opportunities

Enhancing Utilization of Citrus Processing Coproducts
A continuous process using steam to enhance the release of pectic hydrocolloids and phenolic compounds from citrus or other biomass processing waste has been developed. This is an environmentally friendly method that does not use organic solvents for extraction. The resulting pectin hydrocolloids could potentially be used as thickening and gelling agents in food. Other potential applications include removal of harmful cations from industrial discharge waters, hydration control, micro encapsulation and as film cast material. ARS is seeking a partner with which to further develop this technology. Publication: Cameron, R. G., Chau, H. K. and Manthey, J. A. (2016), Continuous process for enhanced release and recovery of pectic hydrocolloids and phenolics from citrus biomass. J. Chem. Technol. Biotechnol. doi: 10.1002/jctb.4854. ARS docket no. 16.16. Please contact Joe Lipovsky: joe.lipovsky@ars.usda.gov

Expert System for Automated Profiling of Bioactive Compounds in Plant Materials
Flavonoid compounds from plant sources play important roles in human nutrition. However, analysis of flavonoids in plant materials is a very challenging task due to the diversity of the flavonoid compounds and the complex nature of plant materials. To facilitate the analysis of flavonoid compounds from plants, an

expert system named "FlavonQ" has been developed to rapidly process data. The FlavonQ program will facilitate the analysis of flavonoids in plant materials, especially when reference standards are not available. The results can be used to offer more accurate nutritional information to databases, nutritionists, and dietitians. It will also help clinical researchers to design more meaningful feeding studies (human or animal) and clinical trials. ARS docket no. 105.16. Please contact Jim Poulos: jim.poulos@ars.usda.gov

Process for Preparing Carbohydrate Polyurethanes Using Microwave Synthesis

A rapid method for producing carbohydrate polyurethanes from agricultural by-products using microwave technology has been developed. This process reduces preparation time of carbohydrate polyurethanes from day/hours to a few minutes. The method may enable broad synthesis of customized carbohydrate polyurethanes for specific uses such as foam cushions, insulation, seals, gaskets, durable machines, bushings, wheels, adhesives, textiles, flooring, plastic parts, and hoses. The bio-based polyurethanes may provide new value added opportunities for agricultural by-products while reducing the environmental footprint relative to polymeric materials based on non-renewable resources. ARS dockets 17.16. Please contact Renee Wagner: renee.wagner@ars.usda.gov

Available Technologies for Licensing

Each year, approximately 60 new patents are issued by the U.S. Patent Office for USDA inventions. The Office of Technology Transfer (OTT) transfers these inventions through licenses to the private sector for commercialization. Here is a link to *recently filed* U.S. patent applications that are available for licensing. This list is updated monthly so check back often! http://www.ars.usda.gov/Business/Business.htm

ARS Digital Online Research Magazine

AgResearch is a monthly publication highlighting short features on the scientific research discoveries occurring at all of ARS' research laboratories across the Nation and abroad. View *AgResearch* at http://agresearchmag.ars.usda.gov. One can subscribe to electronic delivery of the magazine on the website.

USDA Blog

Check out USDA Blog site for updates on Agricultural issues (http://blogs.usda.gov). One can sign up for email updates on the website by checking boxes of categories of interest including the blog, news categories and social media.

VIVO

USDA VIVO provides a powerful Web search tool for connecting researchers, research projects and outcomes and others with relationships to the research. The idea is to link researchers with peers and potential collaborators. VIVO makes it possible to quickly identify USDA scientific expertise. (http://vivo.usda.gov).

We are seeking contributions for future ARP Network Notes from members who wish to share information that would be of interest to the group. Suggestions include events, Ag challenges and community initiatives. For ideas of content for future notes, please contact Cathy Cohn at cathleen.cohn@ars.usda.gov.

Get more information: www.ars.usda.gov

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